



VLPC Detectors: Shift Training & Reference Guide

by the CFT, CPS, and FPS Groups
(Version 1.5, September 2002)

DØ Experiment

Note: *You are invited to make comments and suggestions by writing in this paper version. However, if you do so, please sign & date any comments you write in here, so we can get clarifications if needed. Thanks.*



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*See also separate Black Binder on "CFT+PS Monitoring and Examine" located in DØ Control Room: CFT+PS Console area.

†See also: J. Warchol's note on "SDAQ Runs, Calibrations..." located in Black Binder.



Shift Guide: Outline

- **Modes of Operation**
- **Purpose**
- **Background**
 - ◆ **Daq System**
 - ◆ **Visible Light Photon Counter (VLPC) detectors**
 - * **Central Fiber Tracker (CFT), Central Preshower (CPS), and Forward Preshower (FPS)**
- **Tools**
 - ◆ **Daq tools**
 - ◆ **Examine/histoscope**
 - ◆ **Other tools: Monitoring and Debugging**
- **Troubleshooting**
- **Administrative Issues**



Modes of Operation

- **Global running (Luminosity conditions)**
 - ◆ **About 5 days a week**
 - ◆ **Primary tools used are: Examine, cft_gui, and e-logbook.**
- **Supporting experts during beam studies**
 - ◆ **Remaining 2 days and random breaks.**
 - ◆ **Take 'cft' or 'ps' only runs at expert's request.**
 - ◆ **Use all the tools.**
 - ◆ **More complicated and chaotic.**
- **Shifts:**
 - ◆ **Owl: 12:00 am – 8:00 am**
 - ◆ **Day: 8:00 am – 4:00 pm**
 - ◆ **Eve: 4:00 pm – 12:00 am**
 - * **Owl shift is 1st shift of the day**
 - * **See schedule on d0_at-work web page link for dates assigned to you**
 - * **Shifter required to arrive on shift about 5-10 minutes prior to start of shift: discuss current system status with previous shifter**

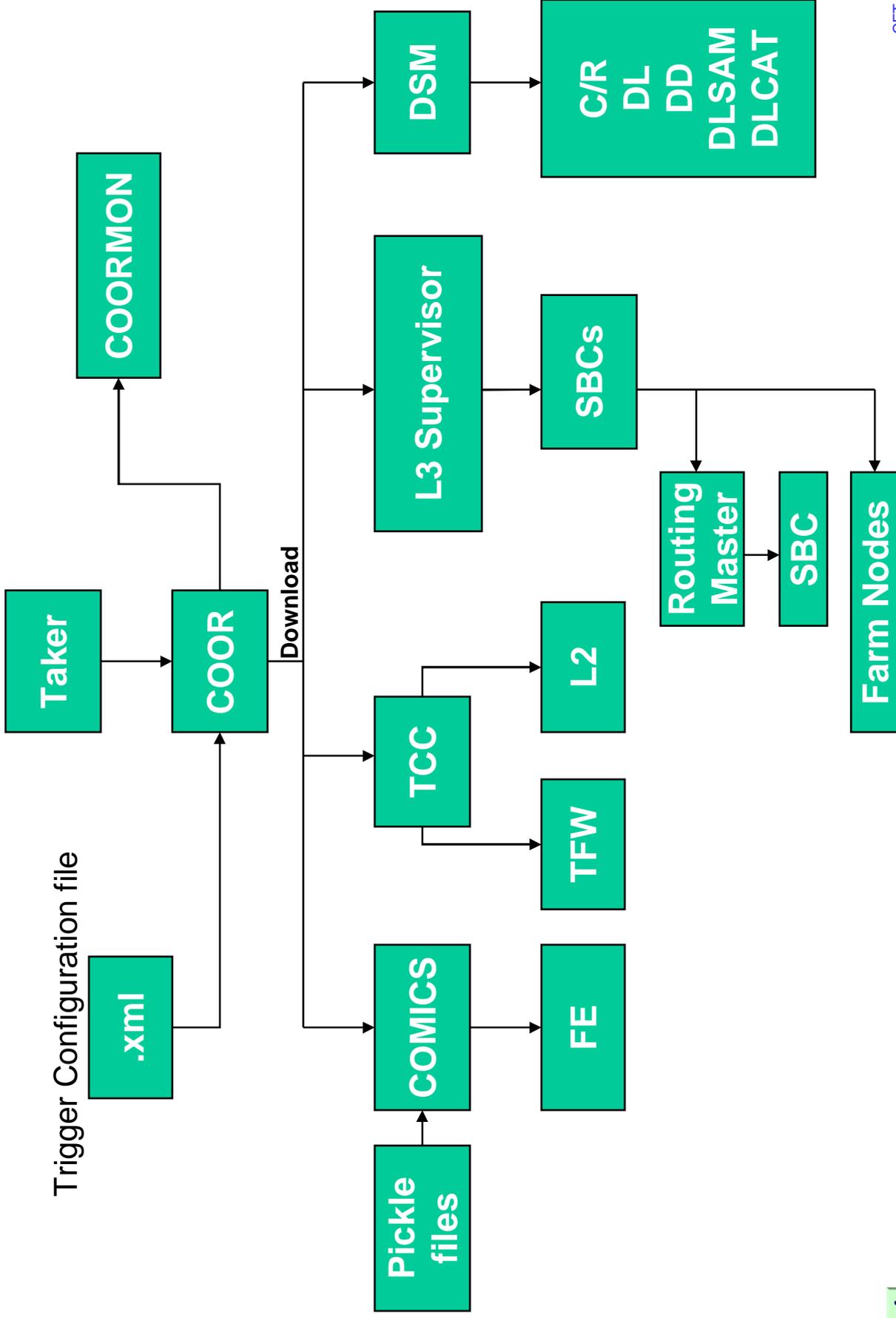


Purpose of shifts

- **Monitor detector readout and response**
 - ◆ **Cryo/Temp**
 - ◆ **Bias**
 - ◆ **Insure data quality**
- **Minimize down time**
 - ◆ **Fix most problems**
 - ◆ **Call experts when necessary**
- **Take calibration runs**
- **Understand the detector and optimize it's performance**
- **Feedback on tools needed for shifts**
- **Accomplish stated shift goals**

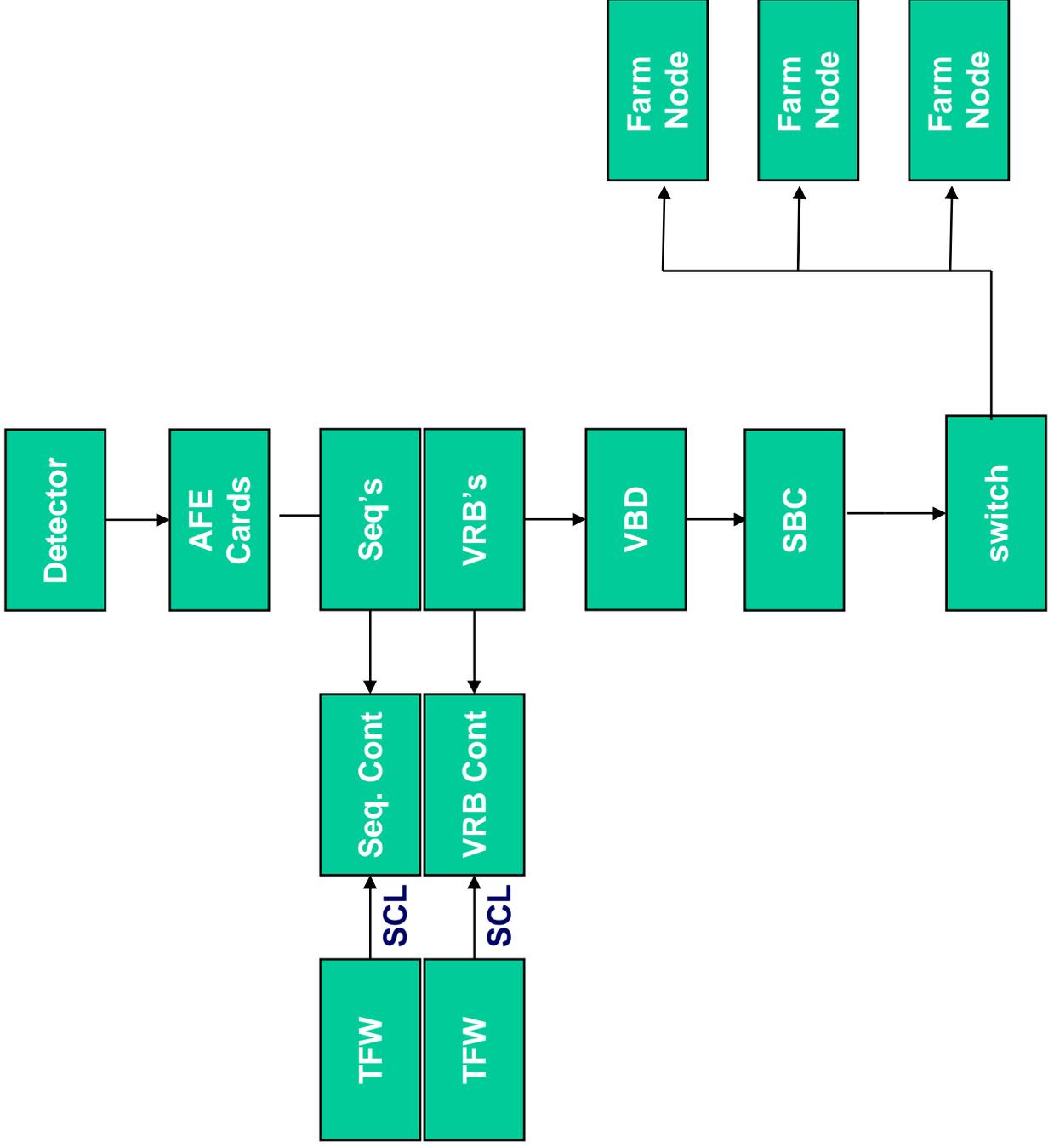


DAQ Run Control Diagram



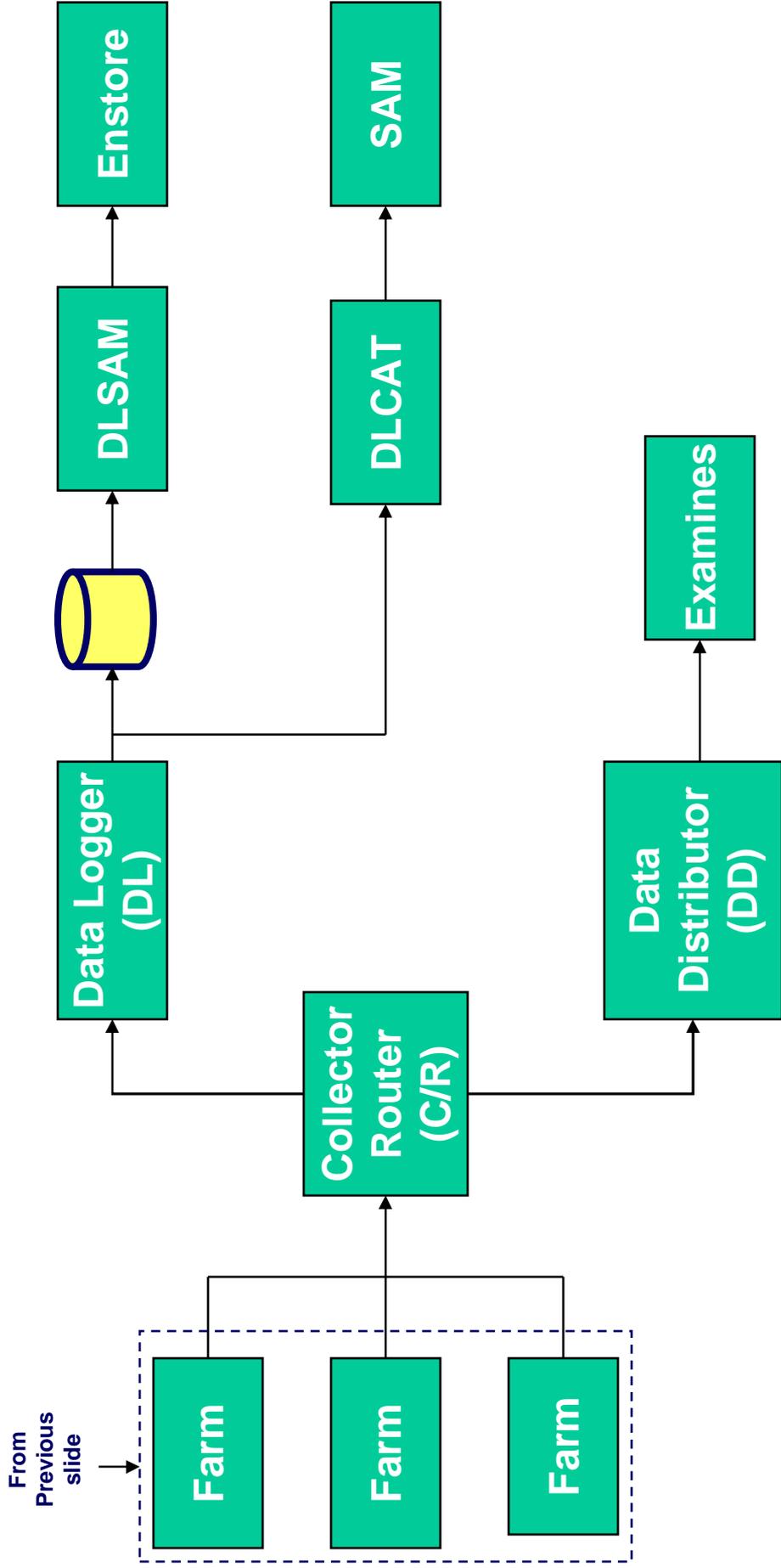


Primary DAQ Data Flow



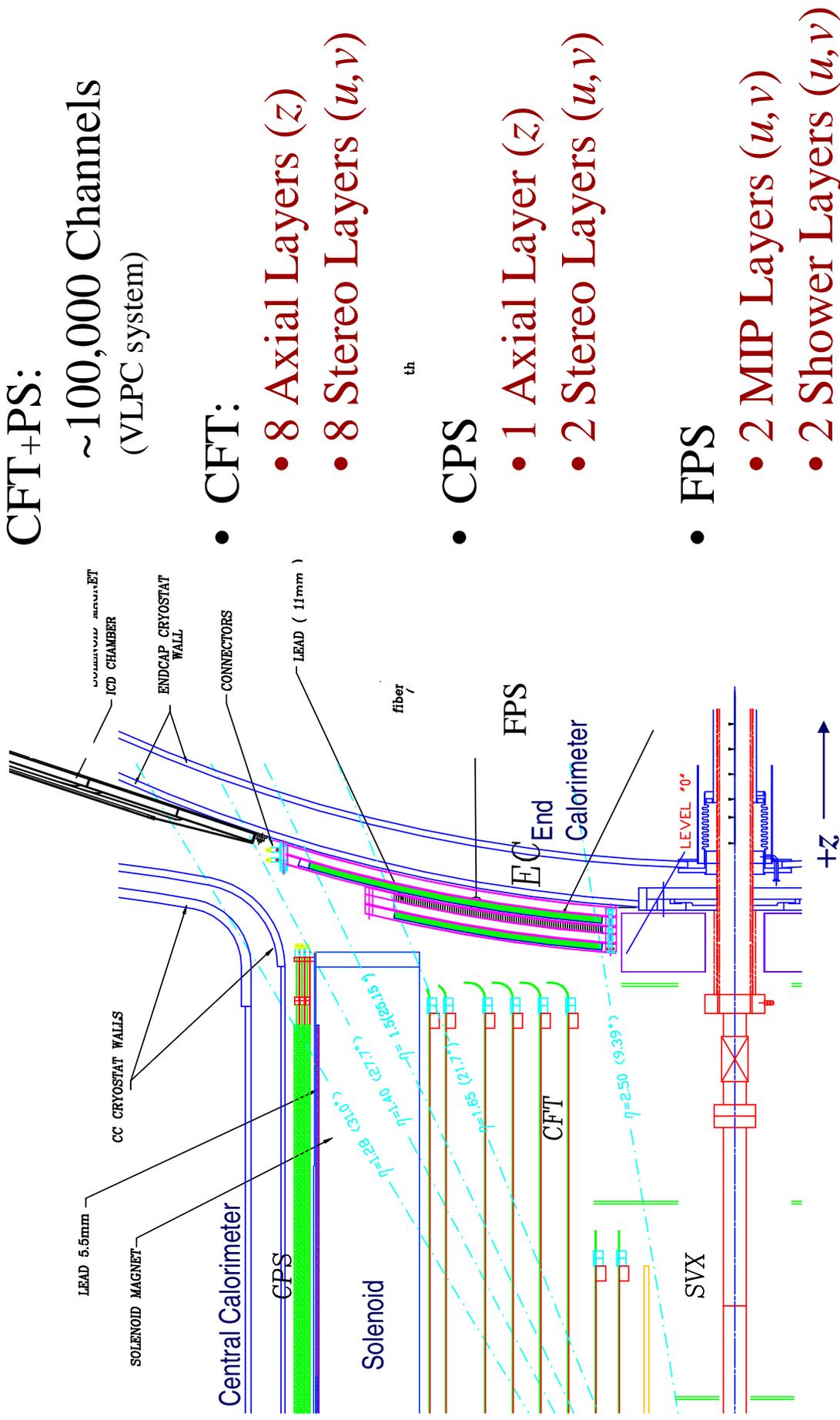


Primary DAQ Data Flow (Con't.)



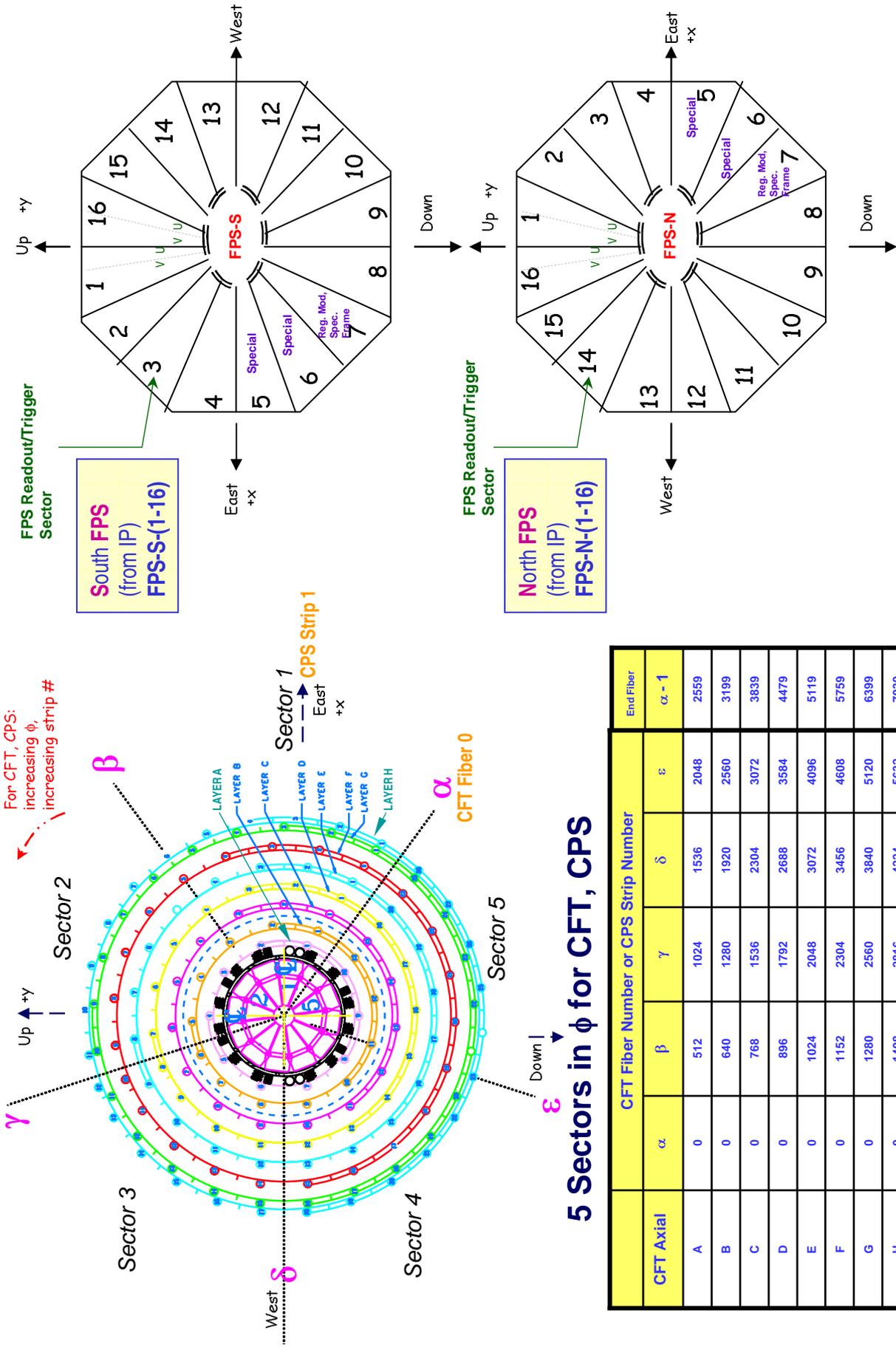


Central and Forward Region





CFT, CPS, FPS: Sectors

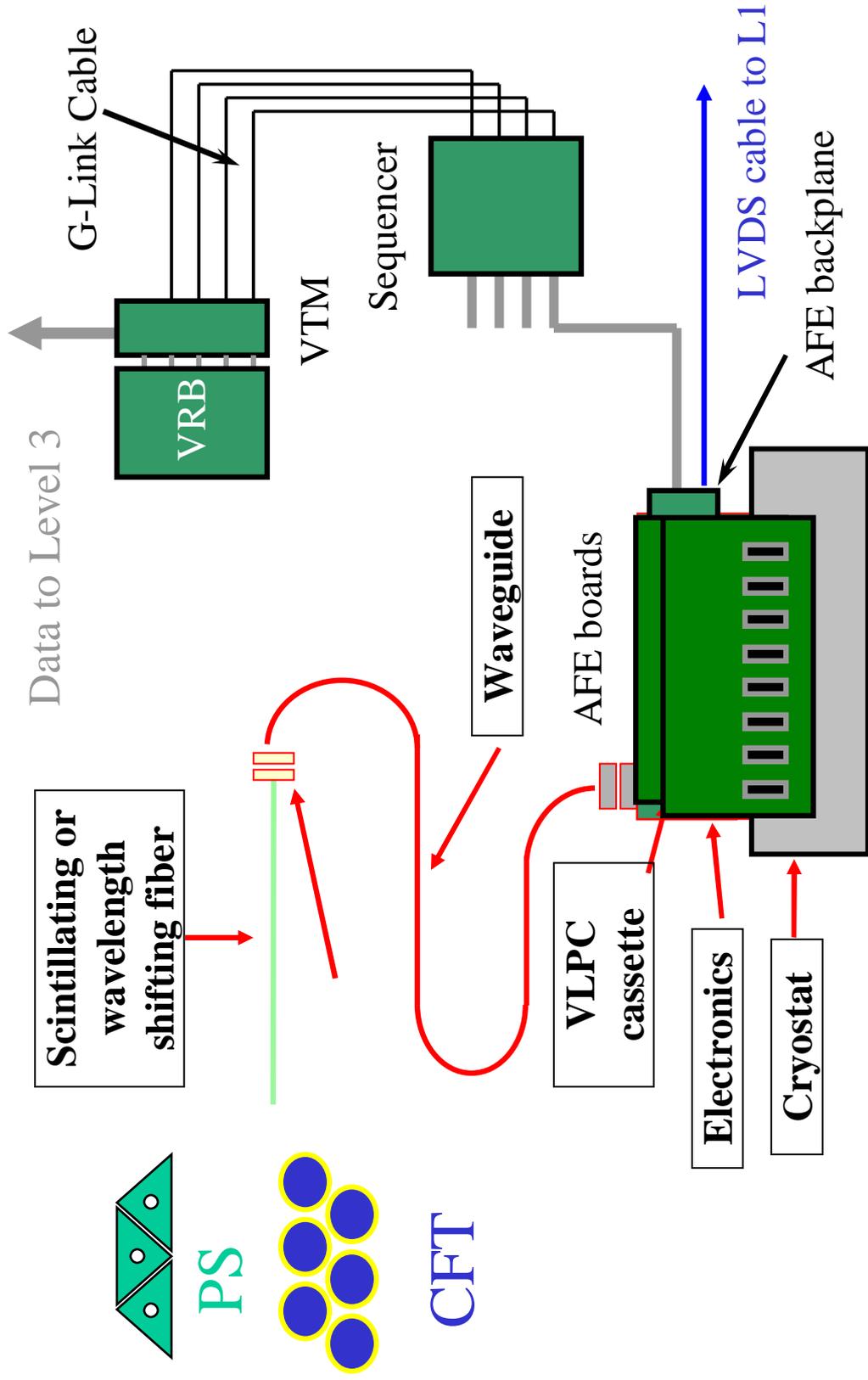


5 Sectors in ϕ for CFT, CPS

CFT Axial	CFT Fiber Number or CPS Strip Number								End Fiber
	α	β	γ	δ	ϵ	$\alpha - 1$			
A	0	512	1024	1536	2048	2559			2559
B	0	640	1280	1920	2560	3199			3199
C	0	768	1536	2304	3072	3839			3839
D	0	896	1792	2688	3584	4479			4479
E	0	1024	2048	3072	4096	5119			5119
F	0	1152	2304	3456	4608	5759			5759
G	0	1280	2560	3840	5120	6399			6399
H	0	1408	2816	4224	5632	7039			7039
CPS Layer 1,2,3	128	384	640	896	1152	1279			1279



PS and CFT readout





Shifter's Primary Tools (Summary)

- **DAQ tools**
 - ◆ **Taker**
 - * **SDAQ (Calibration, Pedestal Runs)**
 - ◆ **Daq monitor**
 - ◆ **l3x_qt_display + DAQ_Dialog**
 - ◆ **Coormon**
 - ◆ **Electronic Logbook (e-log)**

- **Online Monitoring Software: Examine**
 - ◆ **CFT examine**
 - ◆ **CPS examine**
 - ◆ **FPS examine**
 - ◆ **Histoscope Browser**
 - ◆ **CTT Examine + ROOT browser**

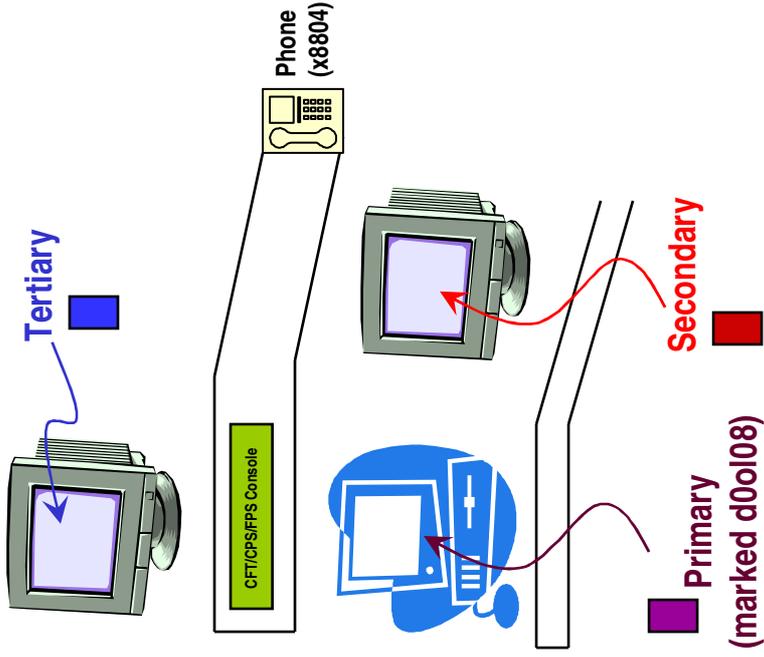
- **CFT+PS specific**
 - ◆ **cft_gui**
 - ◆ **Other Monitoring Software (e.g., AFE Monitor)**
 - ◆ **FEB_Util**
 - ◆ **Channel Archiver**



Basics: Cold Start



D0 Control Room: CFT + PS Station



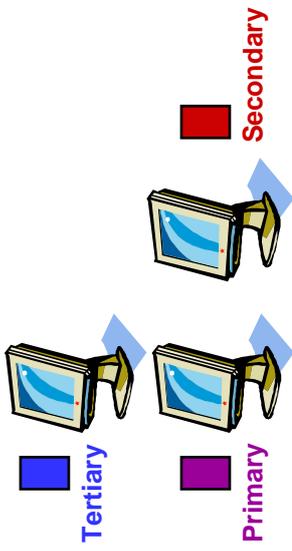
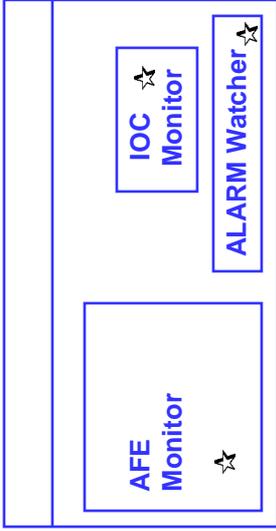
- If a reboot or power outage occurred: Log-on and start the CFT+PS console...
- To do so, from d0o108 machine, type at login screen:
 - ◆ Username: d0cft
 - ◆ Password: ****
- One-by-one start-up each tool and/or gui in the appropriate window shown on the next slide. Please follow the conventions shown on the next slide.



Basics: CFT+PS Console

- Keep console organized
- Uniform from shifter-to-shifter: avoid confusion

Tertiary



Primary

Shifts		Projects			Personal	
CFT Examine	◆ CPS Examine	◆ FPS Examine	☆ SDAQ	☆ cft_gui (x50 details)	VNC to LED	
TC Plot	☆ CTT Examine	☉ DFE Download	IOC + Taker	x51 details	big brother	rmi

Secondary

Electronic Logbook ☆	DAQ Monitor ☆	coormon ☆
◆ Netscape top08 top24 top35	☆ I3xmon + I3x-qt (+DAQ Dialog)	FEB_UTIL ☆

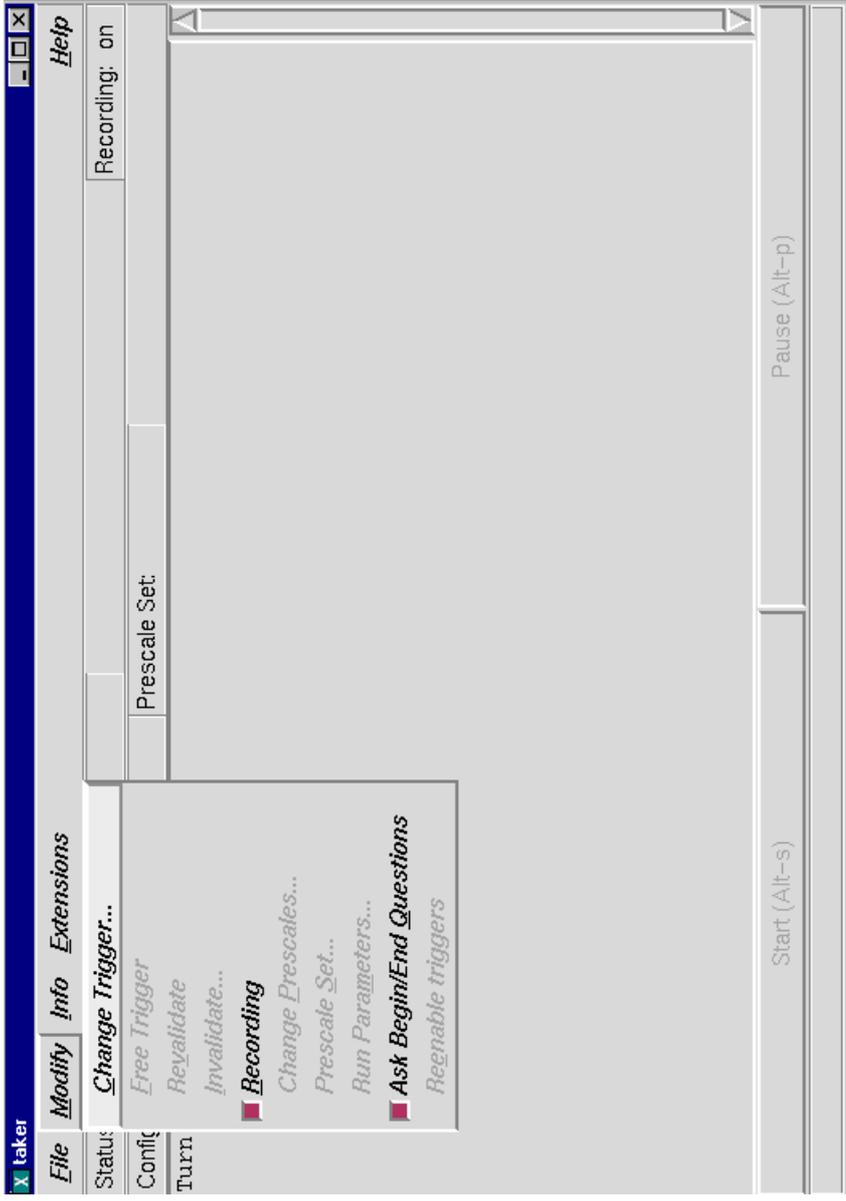
Where to run/launch tools and gui's from:

- ☆ Run on d00l08 (default x-term opened)
- ◆ Run on d00l24
- ☉ Run on d00l35

Note: To conserve memory consumption, common practice to not open cft_gui's [details] for each crate during global running. Can open if necessary (e.g., download failures, etc.)



Taker



To launch taker, type:

- **setup d0online**
- **start_daq taker**

Hex #	Name	Dec #
0x50	cftax	80
0x51	cftst	81
0x52	cps	82
0x53	fps	83

1. Go to: Modify → Change Trigger
2. If sdaq run **Select calibration/cft/calib-cft-0x5*-allcr-1.1**
3. If pdaq run **Select commissioning/tracking/pulser-<Cr Name>-1.1**
4. Press start button.
5. When finished, good practice to Modify → Free Trigger.



SDAQ Running (cont.): ioc login

The image shows four terminal windows, each with a title bar indicating the crate and year. Each window contains the following text:

- Top-left: `> telnet t-d0-mch2 2017`
`loc login - Crate x50:`
`> telnet t-d0-mch2 2017 <enter>`
- Top-right: `> telnet t-d0-mch2 2020`
`loc login - Crate x53:`
`> telnet t-d0-mch2 2020 <enter>`
- Bottom-left: `> telnet t-d0-mch2 2018`
`loc login - Crate x51:`
`> telnet t-d0-mch2 2018 <enter>`
- Bottom-right: `> telnet t-d0-mch2 2019`
`loc login - Crate x52`
`> telnet t-d0-mch2 2019 <enter>`

Connecting to IOC (for SDAQ):

a) For a given crate, type the appropriate syntax (telnet ...) as shown on each xterm on this slide.

b) Here: if (a) is done, one does not need the username, password –

username: ioc
password: ****

➤ In appropriate CFT+PS console/window, organize your SDAQ session as shown on this slide.

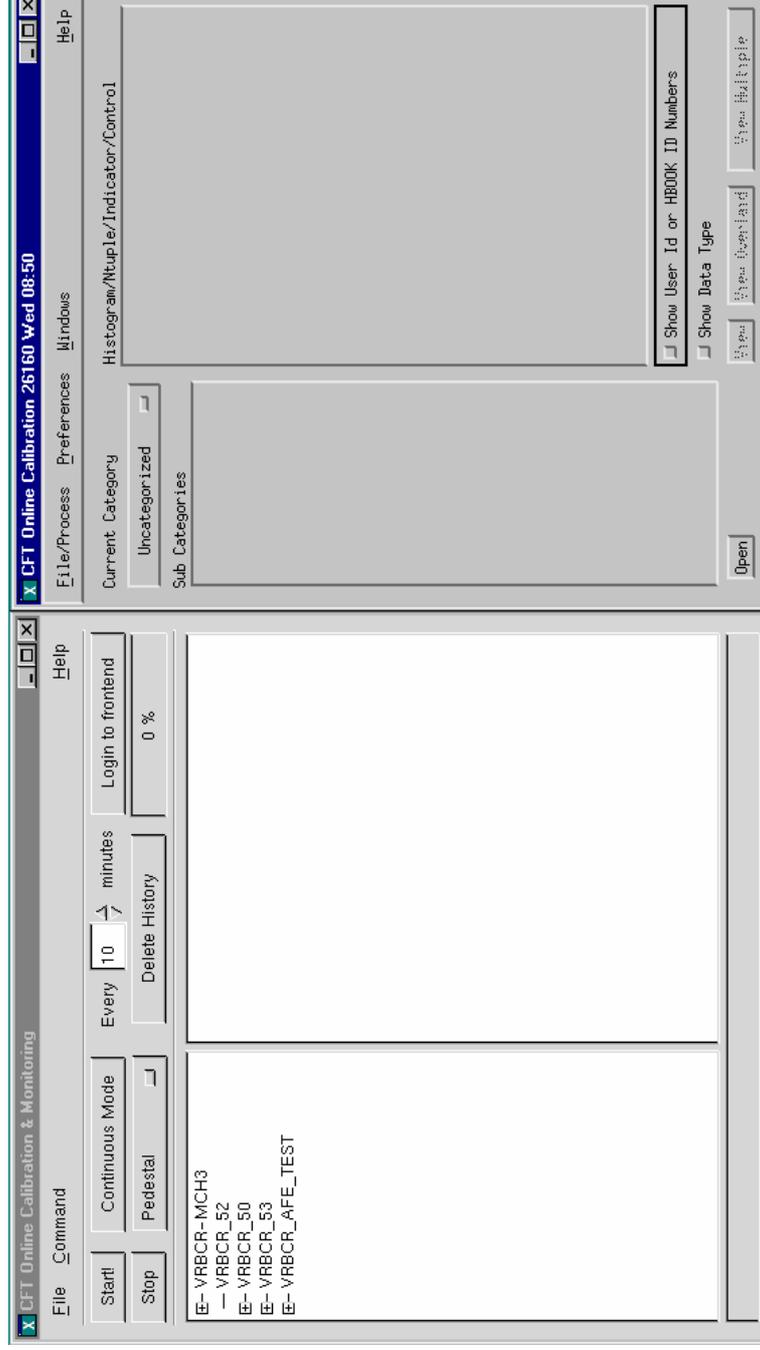
➤ **Note: for a particular crate, to reboot the ioc, press in that crate's x-term window: <ctrl>-X**

The screenshot shows the Taker software interface. At the top, there is a menu bar with options: File, Modify, Info, Extensions, Help. Below the menu bar, there are several status indicators: Status: Recording: on, Prescale Set: Prescale Set: (with a dropdown arrow), and Turn: (with a dropdown arrow). A context menu is open over the Turn indicator, listing options: Change Trigger..., Free Trigger, Revalidate, Invalidate..., Recording (with a red square icon), Change Prescales..., Prescale Set..., Run Parameters..., Ask Begin/End Questions (with a red square icon), and Reenable triggers. At the bottom of the window, there is a 'Taker Window' label and a 'Start (Alt-s)' button. On the right side, there is a 'Pause (Alt-p)' button.



SDAQ Running (cont.)

1. In xterm (opened in d0o108), type the following:
 1. **setup d0online**
 2. **cft_sdaq**
 1. Username for account is: **cft_calib@d0onprd**; password is: *******
 2. In “CFT Online Calibration & Monitoring” Choose the electronics you want and the histograms you want (These are named afe*).
 3. Press [start]
 4. The histograms you asked for will appear in the histogram window.
 5. To clear histogram history: highlight histo-name, click [Delete History].





DAQ Monitor

To launch DAQ Monitor, type from x-term:

1. setup d0online
2. start_daq_monitor

DAQ Process Overview Fri Sep 13 21:12:53 2002

Component	Status	Connection
L1 Trigger Status		Up
L2 Trigger Status		Up
L3 Filter Status		Up
Col/Router Status		Up
Data Logger Status		Up
SDAQ Status		Up
Distributor Status		Up
DSM Status		Up

L1 Trigger Monitor Fri Sep 13 21:14:01 2002

Trig#	Trig Name	Fired (Hz)	And/Or Fired (Hz)	Exposed (Hz)	Prescaler Ratio
0	ALiveBX	17.189	1715408.126	17.189	100000
1	ALiveBX^2	372.743	1715408.126	372.743	4500
2	ALiveBX^3	83.819	1715408.126	83.819	20000



DAQ Monitor (cont.)

Keep an eye on 0x50,51,52,53. If x50 thru x53 and things in the x60s all go busy it's probably the L2. (and DAQ shifter will take care of it.)

Also, keep an eye on 0x13, which is the L1CTT crate; this may or may not be in the run (see white board for status)...

(Column Titles)

GS#	L1 Err	L2 Err	Status	L1 Accept(Hz)	L2 Accept(Hz)	L1 Busy(%)	L2 Busy Raw(%)	L2 Busy Delay(%)	L2 Bz Cycles(%)
0x0	0	0	0x1100	474.732	100.794	0.0	0.0	0.0	0.0
0x1	0	0	0x1100	474.732	100.794	0.0	0.0	0.0	0.0
0x2	0	0	0x1100	474.732	100.794	0.0	0.0	0.0	0.0

(Scroll down to see CFT+PS crates)

Trig	Trig Status	L1 Accept	L2 Accept	L1 Busy	L2 Busy Raw	L2 Busy Delay	L2 Bz Cycles
0x48	0	0	0x1000	473.757	100.659	0.025	0.019
0x49	0	0	0x1000	473.757	100.659	0.025	0.019
0x4a	0	0	0x1000	473.757	100.659	0.025	0.019
0x4b	0	0	0x1000	473.757	100.659	0.025	0.019
0x4c	0	0	0x1000	473.757	100.659	0.025	0.019
0x50	0	0	0x1000	473.757	100.756	0.966	0.0
0x51	0	0	0x1000	473.757	100.756	0.986	0.0
0x52	0	0	0x1000	473.757	100.756	0.942	0.0
0x53	0	0	0x1000	473.757	100.756	0.875	0.0
0x60	0	0	0x1000	473.757	100.756	1.801	0.0
0x61	0	0	0x1000	473.757	100.756	1.806	0.0
0x62	0	0	0x1000	473.757	100.756	1.907	0.0
0x63	0	0	0x1000	473.757	100.756	1.825	0.0
0x64	0	0	0x1000	473.757	100.756	1.795	0.0
0x65	0	0	0x1000	473.757	100.756	1.817	0.0
0x66	0	0	0x1000	473.757	100.756	1.648	0.0
0x67	0	0	0x1000	473.757	100.756	1.841	0.0
0x68	0	0	0x1000	473.757	100.756	1.964	0.0
0x69	0	0	0x1000	473.757	100.756	1.999	0.0

Level 1, 100% FEBs reported in this Column — Good to see l3xqt-display also.



DAQ Tool: l3x_qt_display & l3xmon

To launch l3x_qt_display, type at prompt in d0o135:

1. setup d0online
 2. start_daq l3xqt
- also, in same console, launch l3xmon from d0o108:
3. setup d0online
 4. start_daq l3xmon

Supervisor	Misc	DAQ	Pics
d08cc033b_32	96/100 Hz		
d08cc035b_70	96/103 Hz		
d08cc036b_71	93/100 Hz		
d08cc038b_50	96/102 Hz		
d08cc039b_22	96/103 Hz		
d08cc040b_48	93/101 Hz		
d08cc042b_101	96/101 Hz		
d08cc043b_96	96/98 Hz		
d08cc044b_51	96/102 Hz		
d08cc045b_56	96/103 Hz		
d08cc046b_75	96/106 Hz		
d08cc048b_102	96/101 Hz		
d08cc049b_103	96/99 Hz		
d08cc050b_100	96/101 Hz		
d08cc051b_98	96/102 Hz		
d08cc052b_99	93/105 Hz		
d08cc053b_105	96/101 Hz		
d08cc055b_106	93/104 Hz		
d08cc056b_107	96/102 Hz		
d08cc059b_53	96/103 Hz		

total query time (ms): 5674
queries: 39748
query interval: 3 s
Monitor Server

Click [DAQ]
to get DAQ Dialog Window

DAQ Dialog Window:

DAQ is Good
No crates are >10% FEB at this time.)

50
100
% FEB

If Crate x50 goes FEB, you get this Red Box in DAQ Dialog Window:

This window (in addition to the DAQ monitor) shows which crates have > 10% FEB.

Monitor to see status of crates x50, 51, 52, 53 and CTT crate x13



Electronic Logbook



LogBook

Log In / Log Out
Entry Signers
Administrator
Change Password
Search
Thread Explorer
Current Situation
About LogBook
Exit LogBook

DAQ Shift CONTROLS CAPTAIN Shift DETECTOR Shift Archive Report Page Tutorial

CAL CFT CPS FPS ICD LUM MUO L1MUO SMT SMT Calib

CFT Log October 11, 2001

Entries Edit Font Insert Image Check Category

Date Created: Thursday, October 11, 2001 12:08:26 PM CDT
Created By: DETECTOR_Shift/CFT
Topic: CFT Log
Operator: (ENTERED ON ARCHIVE)

© words

Insert Text Here

Text
Pen
Binary File
Execute
Acnet

Click [Text] and drag into window to start a new entry.

The Logbook and You?

Document the state of the detector for each entry. _____

Are we in a global run? If so, what run number? _____

Make entries often, and be detailed. _____

Also, paste captured images, where appropriate. _____



Capturing Images

- Useful to capture images of certain histograms, gui conditions, FEB_Util status, temp/cryo and bias plots, etc...
 - ◆ This will help in maintain history of system.
 - ◆ Allow experts to debug/understand system better.
 - ◆ To do so, simply type:
 - * `[d0cft@d0o108~] import filename.jpg`
 - ◆ Mouse pointer temporarily turns into cross-hairs; left-click on the window you wish to capture image of
 - ◆ Wait ~1-2 seconds, cross-hairs turns back to pointer.
 - ◆ Note: filename.jpg has been created. You can check this by typing:
 - * `[d0cft@d0o108~] xv filename.jpg` (this opens an Image Browser)
 - ◆ You can also capture portion of the window/image:
 - * Again at the prompt, type: `import filename.jpg`
 - * Mouse pointer turns into Cross-hairs → left-click on one corner of the image you wish to capture, and while holding left-mouse button down, drag the mouse to opposite corner → release mouse button.
 - * Again, filename.jpg has been created.



Electronic log (cont.)

- a) To make an entry, do the following:
 1. setup d0online
 2. start_daq logbook
 1. Choose Detector Shift and then CFT ->CFT Log
 2. Left-mouse-click on the 'Text' button (far right side of logbook) and drag to the CFT Log page and you will see the attached image.
 3. Make Entry where 'insert text here' is.
 4. Save entry:
 1. Right click on the red heading.
 2. Choose "Archive All non-archived entries"

- b) To read previous entries from web-browsers:
 1. Go to <http://www-d0ol.fnal.gov/>
 2. Choose Logbook (upper left corner)
 3. On the new page at the top are options.
 1. Choose Keyword [CFT]
 2. Choose number of hours and click [to present].
or choose [hours of interest] and press [Search from to].

- c) To paste a captured image (say filename.jpg) into log book:
 1. start the next text entry or position the cursor in the window in which you want the image to be inserted.
 2. Go to insert menu item Click on 'Image' 'From File'
 3. Window appears; choose either [Browse] or Type in the window:
/home/d0cft/filename.jpg <press Enter>

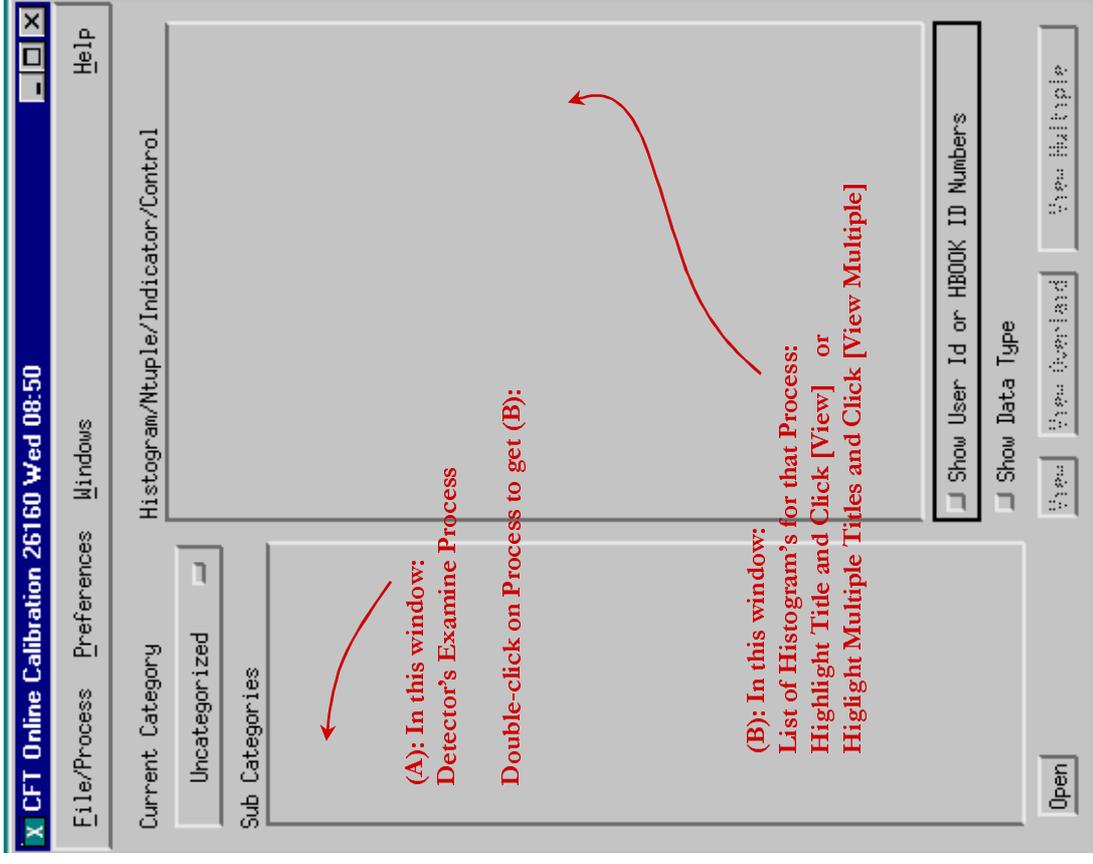


Examine/Histoscope



1. setup d0online
 2. d0ssh d0ol24
 - *now you are connected to d0ol24, then type:*
 1. setup histo
 2. histo &
 3. setup d0online
 4. **start_daq cft_examine** or
start_daq cps_examine or
start_daq fps_examine
 - Type: **init** <press enter>
 - Type: **start** <press enter>
- a) In histo → File → Connect to process
 - Choose the examine process (CFT, CPS, or FPS) you just started.
 - b) Look at histograms... by choosing desired histo and clicking [View] or [View Multiple].
 - c) To exit Examine, in the xterm that examine is running type: **stop** and then: **quit**

Be sure you zero examine regularly, that is the only way you will notice changes in the system. This is done by typing: report cft_examine <enter> and then type: resume <enter>



Also see CFT+PS Examine Black Binder



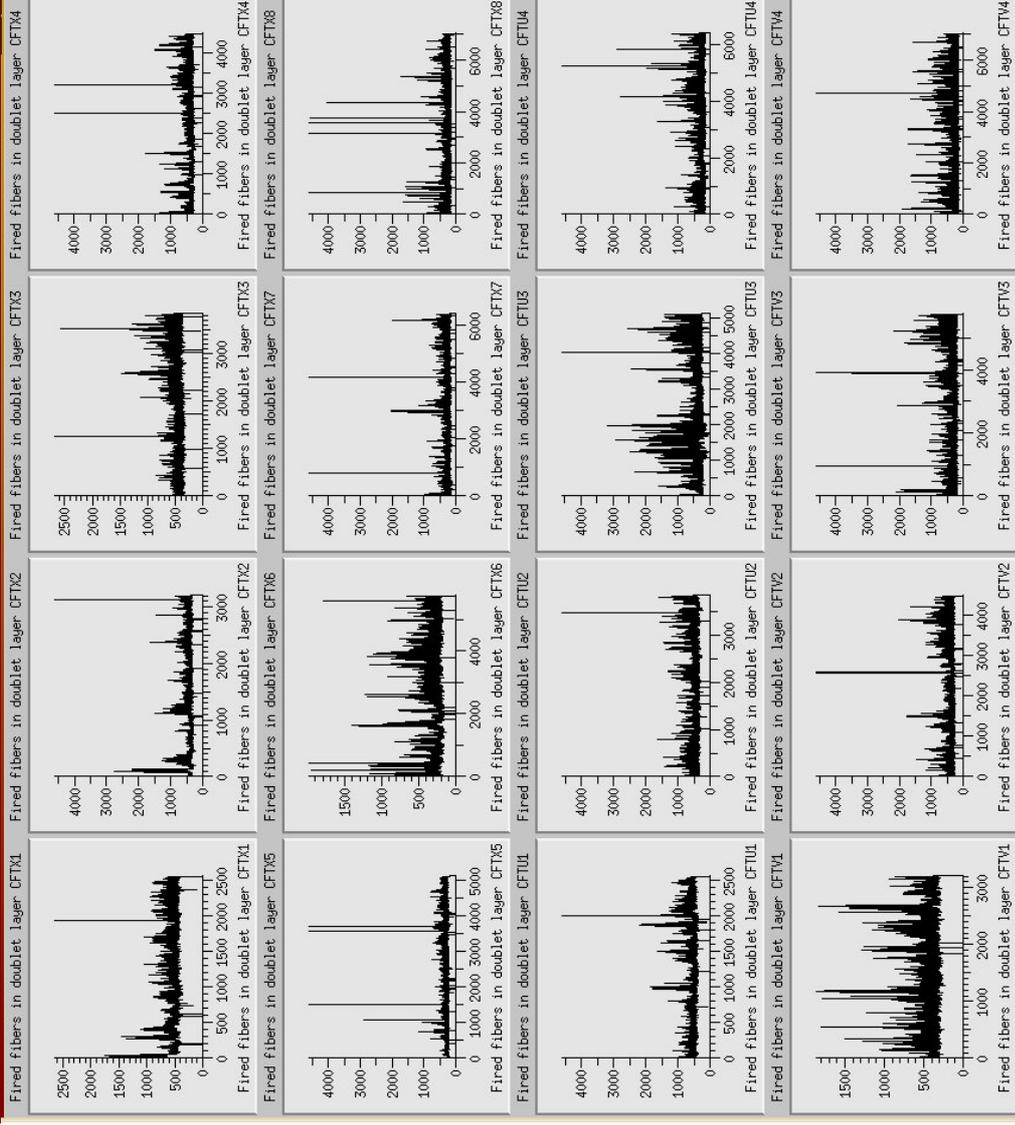
Histograms

➤ Three examines

- ◆ **CFT Examine**
 - * 5 types of histogram
 - Occupancy
 - Number of hits
 - Hit map useful
 - Fired Fibers
 - Triggered Fibers
 - ADC spectrum

- ◆ **CPS Examine**
 - * Similar types of histograms.
- ◆ **FPS Examine**
 - * Similar types of histograms.

E.g., Fired Fiber Distributions



See Black Binder on “CFT+PS Monitoring and Examines” for Reference Examine Plots for all three systems.



Monitoring Software: AFE Monitor

From x-term window, type:

- > setup d0online
- > python ~d0cft/startup_AFE_Monitor.py

...wait a few seconds, AFE monitor will start up;

Note: xterm window will say: Starting AFE Monitor Version 4.1

_ _ X
Help

LV Power Supply	PIC Temperature			Temperature SP-PV			Heater Current			AFE Heartbeat		
	/STAT	-A/+12V	-A/+33V	-A/+55V	-A/+5V	-A/-12V	-B/+12V	-B/+33V	-B/+5V	-B/+55V	-B/-12V	
CFT_LVAFE_PS1	DETAILS	12.08	3.70	5.95	5.20	-11.70	12.16	3.81	6.06	5.26	-11.82	
CFT_LVAFE_PS2	DETAILS	12.20	3.83	6.04	5.28	-11.70	12.12	3.82	5.56	5.28	-11.79	
CFT_LVAFE_PS3	DETAILS	12.15	3.81	6.04	5.24	-11.80	12.11	3.76	6.11	5.29	-11.80	
CFT_LVAFE_PS4	DETAILS	12.09	3.77	6.04	5.23	-11.78	12.09	3.81	6.13	5.27	-11.76	
CFT_LVAFE_PS5	DETAILS	12.17	3.85	6.08	5.39	-11.65	12.21	3.82	6.08	5.31	-11.66	
CFT_LVAFE_PS6	DETAILS	11.92	3.79	6.00	5.25	-11.76	12.15	3.84	6.16	5.29	-11.81	
CFT_LVAFE_PS7	DETAILS	12.06	3.74	6.00	5.18	-11.74	12.04	3.75	6.08	5.20	-11.66	
CFT_LVAFE_PS8	DETAILS	12.15	3.79	6.08	5.29	-11.86	12.15	3.79	6.17	5.26	-11.84	
CFT_LVAFE_PS9	DETAILS	12.08	3.79	5.97	5.30	-11.68	12.08	3.77	6.05	5.26	-11.55	
CFT_LVAFE_PSA	DETAILS	12.15	3.85	6.08	5.27	-11.61	12.17	3.81	6.19	5.32	-11.63	
CFT_LVAFE_PSB	DETAILS	12.08	3.78	6.05	5.22	-11.70	12.10	3.79	6.07	5.22	-11.74	
CFT_LVAFE_PSC	DETAILS	11.82	3.75	6.05	5.23	-11.74	12.08	3.76	6.10	5.22	-11.74	
CFT_LVAFE_PSD	DETAILS	12.06	3.74	6.04	5.21	-11.78	12.02	3.74	6.16	5.19	-11.86	

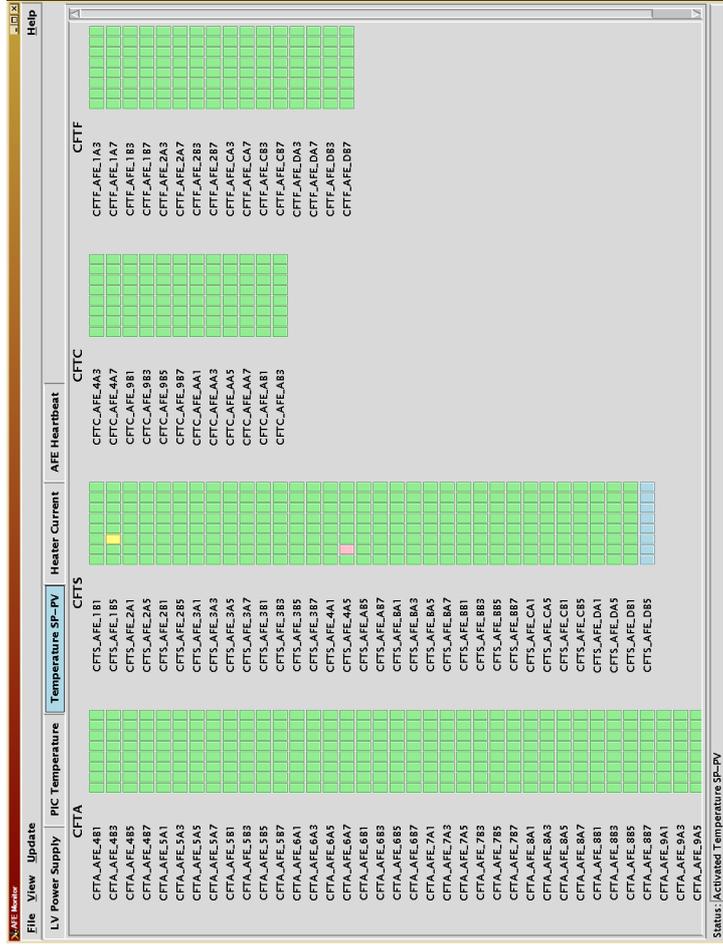
Update Now

Status : Activated LV Power Supply

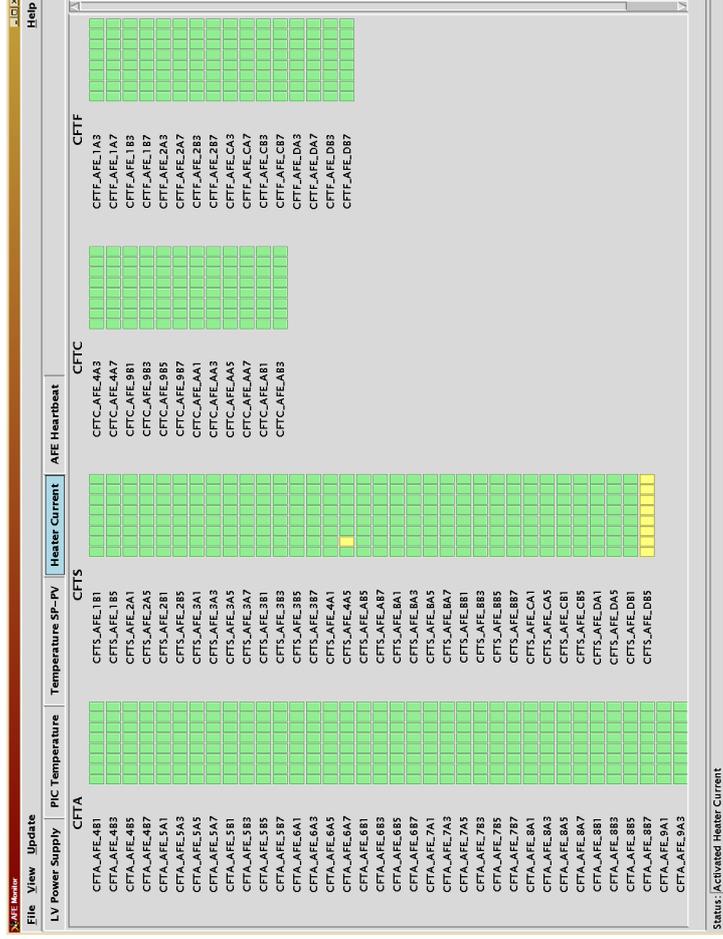


Monitoring Software: AFE Monitor (cont.)

- To monitor Cryo Temp (set_point-PV) and Heater Current status, click on appropriate AFE Monitor Buttons: [Temperature SP-PV] and [Heater Current] respectively.
- One can correlate their status with the [plot cryo] button on cft_gui (see next slide).
- Don't forget to appropriately update status by clicking on [update] on the AFE_Monitor gui.



[Temperature SP-PV] Window



[Heater Current] Window

= Stable

= minor concern

= major concern

(if this is not known (see also sticky notes or AFE status) or does not go away after 5 minutes, then contact expert).



Temp Monitoring

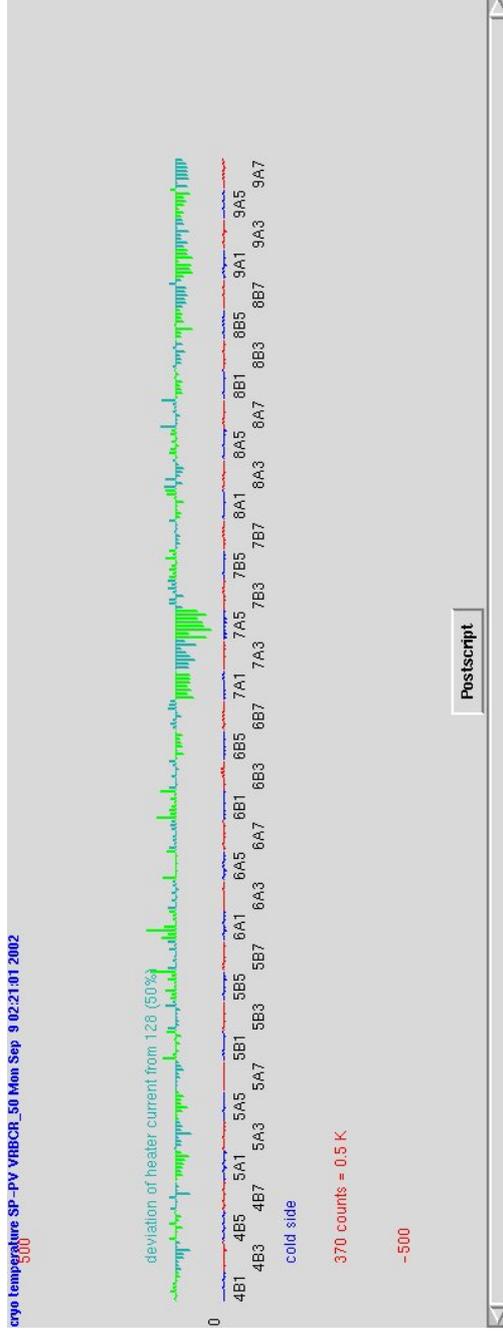
cft_gui

debug: **off** global parameter quit

VRBCR_50	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCU	plot ThreshVrefVthres	plot cryo	plot bias	details
VRBCR_51	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCU	plot ThreshVrefVthres	plot cryo	plot bias	details
VRBCR_52	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCU	plot ThreshVrefVthres	plot cryo	plot bias	details
VRBCR_53	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCU	plot ThreshVrefVthres	plot cryo	plot bias	details
VRBCR_AFE_TEST	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCU	plot ThreshVrefVthres	plot cryo	plot bias	details

[plot cryo] gives:

(note: the behavior should look similar to this!)

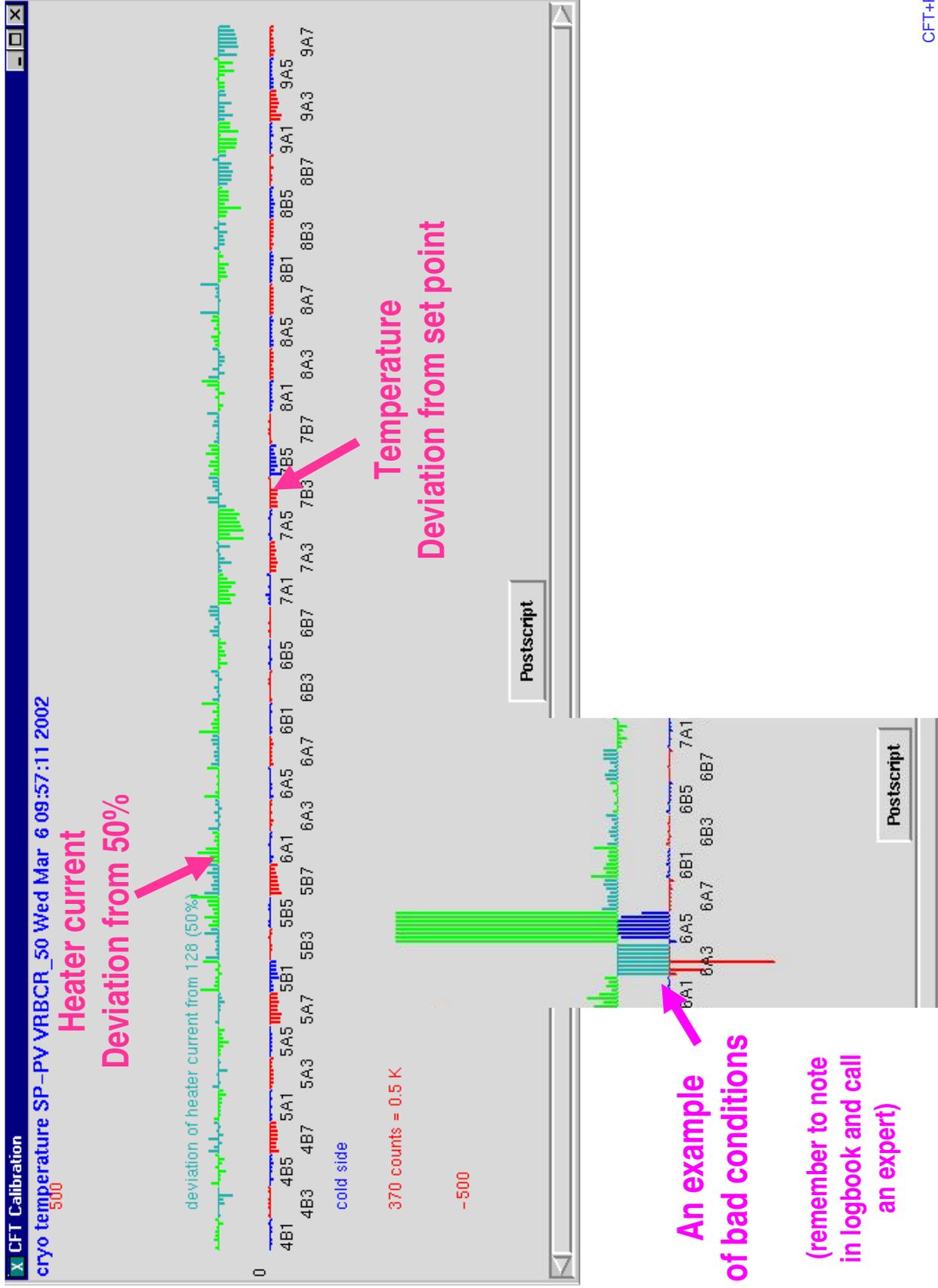


Note: Temperature control is turned on by clicking: [on TempCtl] in cft_gui.

* This should only be done if an AFE crate needed a power cycle or on consulting the expert.



Understanding the display...





LED Pulsar Software & VNC

To open LED pulser controller (LED power ON/OFF and LED voltage settings):

1. open xterm
2. setup vnc
3. vncviewer d0cftled

Password: ***

You are now logged into the NT machine (vnc server) that has software: 'Form1' to control LEDs in CFT+PS.

(i.e., to Log on to NT: username: d0cftled)



Windows NT machine for LED Pulsar Software



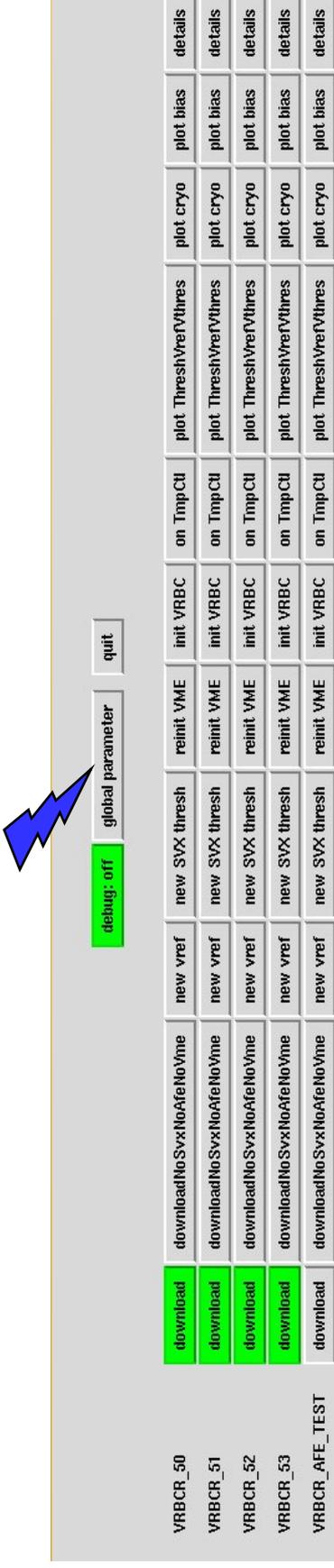
Troubleshooting Basics



- **Power cycle — Do's and Don'ts**
 - ◆ **VRB crates in MCH2** *Only on expert advisement*
 - ◆ **AFE left click from cft_gui** *Only on expert advisement*
 - ◆ **Sequencers** *Only on expert advisement*
- **Global Parameters...**
 - ◆ **Easiest way to fix something is never to break it; check their values before each download.**
- **CFT+PS crates go Front-End Busy (FEB)**
 - ◆ **See next slide for possible solutions.**



Global Parameters (General)



- In cft_gui, Click on [Global Parameters] → from pull-down menu, choose: AFE, SVX, SDAQ Parameters (their respective windows open)...
- Values should be:
 - ◆ SVX Param/SVX Pipeline = 14
 - ◆ AFE Param/VSVX Pipeline = F1
- For Global Physics Run: un-assert Global Threshold (button in SVX Parameter Window)
 - ☞ SDAQ Parameters (see also J. Warchol's Note in Binder for a the particular type of SDAQ run desired):
 - ◆ SDAQ Param/nsteps_v_thresh = 78 (or 0)
 - ◆ SDAQ Param/nsteps_v_ref = 86 or 0
- If any value change, be sure to do a “full” download of crates.



Most Common Problems

Full download **debug: off** global parameter quit

Fast download
“big-button”

VRBCR_50	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCtI	plot ThreshVrefVthres	plot cryo	plot bias	details
VRBCR_51	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCtI	plot ThreshVrefVthres	plot cryo	plot bias	details
VRBCR_52	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCtI	plot ThreshVrefVthres	plot cryo	plot bias	details
VRBCR_53	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCtI	plot ThreshVrefVthres	plot cryo	plot bias	details
VRBCR_AFE_TEST	download	downloadNoSvxNoAfeNoVme	new vref	new SVX thresh	reinit VME	init VRBC	on TmpCtI	plot ThreshVrefVthres	plot cryo	plot bias	details

Most Common Problem tends to be 100% FEB; possible solution*:

Description: The DAQ Monitor and/or I3qxt-display is showing a CFT or PS crate at 100% busy forcing the system to momentarily stop acquiring events. Here, either you (or the DAQ shifter) has noticed the problem and are trying to resolve it.

- Ask DAQ shifter to pause run.
- Check FEB_Util to see probable origin of problem (don't forget to click FEB_Util's [update] button, capture image of FEB_util, archive in logbook).
- Redownload (no SVX, no AFE, no VME) the offending crate — the so-called “big button” shown above:
- Click on: [reinit VME]
- Have DAQ shifter resume the run and CFT+PS shifter should enter problem & solution in logbook.

*** If the above solution fails, try a “Full download” of the offending crate; if this also fails in resolving problem, call the expert.**

Another Problem: SBC?

- See SBC documentation or ask DAQ shifter to resolve this.



Most Common Problems (cont.)

Other Problems* and Misbehaviors (cont.): Hot or Dead Regions

Description: when a region with more than 128 channels drop out or are reading out far more than its neighbors. Here, the detector's Examine will help track this problem.

- Ask DAQ shifter to pause run.
- Document the Run No. and misbehaved state including the Examine image in logbook.
- Redownload (no SVX, no AFE, no VME) the offending crate — the so-called “big button” fast download.
- Have DAQ shifter resume the run.
- Clear the examine (i.e., report `x_examine <enter>`, resume `<enter>`; where `x=cft`, `cps`, or `fps`) and thus, verify that the problem has been fixed.
- Request the DAQ shifter and Captain to start a new run.
- Enter problem and all solutions taken in logbook; enter new Run No. with the new examine histograms.

Other Problems* and Misbehaviors: Missing Events?

Description: certain crates start dropping all or most of its events causing nothing to be recorded. Here, the detector's Examine histos (after refreshing them) will help track this problem. Also, monitor `l3xmon`.

- Ask DAQ shifter to pause.
- Press 'init VRBC' on the offending crate.
- Ask DAQ shifter to resume run. The CFT+PS shifter should enter problem/solution in logbook.

* In either of these problems: if the above solution fails, try a “Full download” of the offending crate; if this also fails to resolve problem, call the expert.



FEB_Util (cont.)

- Diagnose Front-End Busys for CFT+PS crates
- One window for each of the 4 crates for monitoring system status

◆ For Example, *(Note: colors in feb_util are random generated, don't imply anything.)*

☞ During “stable” CFT+PS operation, 0 and 1’s look similar to:

		Top				Bottom									
VRB	SEQ	0	0	0	0	1	1	1	1	0x7c	1	1	1	1	
500B	CFTA_SEQ_03B0E	0	0	0	0	0x7c	1	1	1	1	0x7c	1	1	1	1
		2	0	0	0	0x7c	1	1	1	1	0x7c	1	1	1	1
		3	0	0	0	0x7c	1	1	1	1	0x7c	1	1	1	1

- ☞ Now, Crate x50 goes FEB (see DAQ monitor or l3x_qt_display)
- ☞ Click [update] on FEB_UTIL
- ☞ One of the Sequencers (here, SEQ_03B0E) in crate x50 may appear as:

		Top				Bottom									
VRB	SEQ	0	0	0	0	0	0	0	0	0x7d	1	1	1	1	
500B	CFTA_SEQ_03B0E	1	0	0	0	0x0	0	0	0	0	0x7d	1	1	1	1
		2	0	0	0	0x0	0	0	0	0	0x7d	1	1	1	1
		3	0	0	0	0x0	0	0	0	0	0x7d	1	1	1	1

Solution: Ask DAQ shifter to pause run, capture above image in log-book.

- ☞ Next, you do a “big-button” (fast) download, followed by clicking [reinit VME] for that crate (i.e., crate x50), click [update] on FEB_Util. The FEB_Util gui should go back to “stable” mode with the FEB resolved.

☞ Document Problem and Solution in Logbook.



Administrative Issues

- **DAQ and Captain Shifters**
 - ◆ **Help them, get permission.**
 - ◆ **Communicate effectively.**

- **Do Not hesitate to call the “on-call” expert.**
 - ◆ **On-call expert will carry pager with him/her during their scheduled time. Call “primary” pager first; if “primary” does not answer in 5-10 minutes, please call “secondary” pager.**
 - ◆ **See black CFT+PS binder for “CALL List” and appropriate phone numbers.**

- **D. Alton: schedule people to take 2 shifts with someone experienced**
- **D. Alton: like to schedule in lumps of at least 3 days.**
- **Hopefully 3-4 shifts a month or even ~6 shifts every other month.**
- **We have a checklist of things to do at the beginning of every shift and throughout. See white CFT+PS binder for more details... Do not leave your shift without filling one of these out.**